

REMARKS

This response is intended as a complete response to the Advisory Action dated October 4, 2006 and the Final Office Action dated July 6, 2006. In view of the following discussion, the Applicants believe that all claims are in allowable form.

The Applicants thank the Examiner for her time and input with respect to the present application as a result of the teleconference between the Examiner and Alan Taboada on October 25, 2006. During the teleconference independent claims 1 and 11 were discussed. The teachings of the *Lee* reference (US Patent 5,835,221) were discussed as well as several proposed amendments to the claims. Agreement was reached with respect to the 35 USC §112 rejections, but not as to the remaining rejections. The Applicants hereby file this response containing amendments and arguments for further consideration by the Examiner.

The Applicants further note that the patent number for the *Lee* reference (5,835,221) was inadvertently previously referred to as 5,825,221 by both the Examiner and the Applicants. Please note that the correct US Patent Serial No. for the *Lee* reference is 5,835,221.

CLAIM REJECTIONS

A. 35 USC §112, First Paragraph Claims 1-21, 42 and 43

In the advisory Action, the Examiner maintains the rejection of Claims 1-21, 42 and 43 under 35 USC §112, 1st Paragraph as failing to comply with the written description requirement. The Applicants respectfully disagree.

As noted above, the Examiner has agreed, during the October 25, 2006 teleconference, that the present claims are supported by the specification as filed. Moreover, the Applicants have amended the claims to more clearly recite aspects of the invention. Specifically, the claims 1 and 11 have been amended to clarify the phrase "on the order of" to read "on the same order of magnitude as" as discussed with the Examiner.

Thus, the Applicants submit that claims 1-21, 42 and 43 satisfy the requirements of 35 USC §112 and are patentable thereunder. Accordingly, the Applicants respectfully request that the present rejection be withdrawn, and the claims allowed.

B. 35 USC §102 Claims 1-5, 7-10 and 42; 11, 12, 14-16, 18-21 and 43

Claims 1-5, 7-10 and 42; 11, 12, 14-16, 18-21 and 43 stand rejected as being anticipated by United States Patent No. 5,835,221 issued November 10, 1998, to *Lee, et al.* (hereinafter *Lee*). Applicants respectfully disagree. However, the Applicants have amended claims 1 and 11 to more clearly recite aspects of the invention.

Independent claims 1 and 11 recite limitations not taught or suggested by *Lee*. With respect to 35 USC §102, or "anticipation," the Federal Circuit has repeatedly stated that "there is no anticipation unless all of the same elements are found in exactly the same situation and united in the same way . . . in a single prior art reference." Perkin-Elmer Corp. v. Computervision Corp., 732 F.2d 888, 894 (Fed. Cir., 1984); Kalman v. Kimberly-Clark Corp., 713 F.2d 760, 771, 218 U.S.P.Q. (BNA) 781, 789 (Fed. Cir. 1983).

Lee discloses providing a substrate comprising a material layer having an initial thickness, etching the material layer on the substrate, directing radiation onto the substrate as the material layer is etched, measuring a change in intensity for radiation reflected from the substrate at a pre-selected wavelength, and terminating the etch step upon measuring a predetermined metric for the change in intensity radiation reflected from the substrate at the pre-selected wavelength. However, *Lee* fails to teach or suggest a process wherein the pre-selected wavelength in nanometers is greater than or on the same order of magnitude as the material layer in Angstroms, as recited in claim 1, or wherein the pre-selected wavelength in nanometers is greater than or on the same order of magnitude as the initial thickness of the gate dielectric layer in Angstroms, as recited in claim 11.

The Examiner cites *Lee*, in reference to Figure 2, listing the material layers as a 1500 Å oxide mask, a 1125 Å TiN film, and a 1625 Å polysilicon film. Similarly, with reference to Figure 3, the Examiner cites the material layers as a 1000 to 2000 Å oxide mask, a 1000 Å titanium nitride film, and a 2000 Å polysilicon film. Every one of these material layers cited by the Examiner, as well as every material layer disclosed in the reference, is on the order of thousands of Angstroms.

The Examiner also cites the pre-selected wavelengths used to etch the material layers disclosed by *Lee* as being 2.0 eV (~620 nm), 2.8 eV (~443 nm), 3.3 eV (~376)

and 4.0 eV (~310 nm). Every one of these wavelengths cited by the Examiner, as well as every wavelength disclosed in the reference, is on the order of hundreds of nanometers. Accordingly, *Lee* fails to teach or suggest a process wherein the pre-selected wavelength in nanometers is greater than or on the same order of magnitude as the material layer in Angstroms” because every disclosed wavelength in nanometers (i.e., hundreds) is less than the order of the thickness of the disclosed material layers in Angstroms (i.e., thousands). Therefore, a *prima facie* case of anticipation has not been established because *Lee* does not identify each of the claimed elements as arranged in claims 1 and 11.

In the Advisory Action dated October 4, 2006, the Examiner presented a table (Table A) entitled, “Comparison of Preselected Wavelengths in nm to Intensity of High-k Dielectric Material to be Etched in Angstroms.” The Examiner asserts that the table shows that the pre-selected wavelength in nanometers is greater than or on the order of the initial thickness of the material layer in Angstroms. (Advisory Action, p. 2, ll. 17-18.) The Applicants respectfully disagree.

Table A is reproduced, below:

Preselected Wavelength, eV	2	2.8	3.3	4.0
Nm	620	443	376	310
Thickness of high-k dielectric, Å	1000-2000	1000-2000	1000-2000	1000-2000

As is clearly shown by the table, in each example, the preselected wavelength is hundred of nm (310 – 620), while the thickness of the high-k dielectric is thousands of Å (1000 – 2000). Hence, *Lee* clearly fails to fails to teach or suggest a process wherein the pre-selected wavelength in nanometers is greater than or on the same order of magnitude as the material layer in Angstroms, as recited in claim 1, or wherein the pre-selected wavelength in nanometers is greater than or on the same order of magnitude as the initial thickness of the gate dielectric layer in Angstroms, as recited in claim 11. Therefore, a *prima facie* case of anticipation has not been established because *Lee* does not identify each of the claimed elements as arranged in claims 1 and 11.

Thus, independent claims 1 and 11, and claims 2-5, 7-10 and 42; 12, 14-16, 18-21 and 43 depending therefrom, are patentable over *Lee*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claims allowed.

C. 35 USC §103 Claims 3, 14, 42, and 43

Claims 3, 14, 42, and 43 stand rejected as being unpatentable over *Lee* in view of United States Patent No. 6,599,847, issued July 29, 2003, to *Jang, et al.* (hereinafter *Jang*). The Applicants respectfully disagree.

In the Advisory Action, the Examiner withdrew the 35 USC §102 rejection of the above claims in view of *Lee* and asserted the above rejection in its stead. However, the Examiner has not pointed to any teaching or suggestion of *Jang* that would, in combination with *Lee*, yield the limitations presently recited in the claims.

Jang teaches a sandwich composite dielectric layer in which various layers having various thicknesses are disclosed. (*See generally, Jang.*) However, *Jang* fails to teach or suggest a modification of the teachings of *Lee* that would result in a process wherein the pre-selected wavelength in nanometers is greater than or on the same order of magnitude as the material layer in Angstroms, as recited in claim 1, or wherein the pre-selected wavelength in nanometers is greater than or on the same order of magnitude as the initial thickness of the gate dielectric layer in Angstroms, as recited in claim 11. Therefore, a *prima facie* case of obviousness has not been established because the combination of *Lee* and *Jang* fails to yield the limitations recited in claims 1 and 11.

D. 35 USC §103 Claims 6 and 17

In the Advisory Action, the Examiner notes the rejection of claims 6 and 13 under 35 USC §103 in view of *Lee* and *Grimbergen*. However, as the rejection in the Final Office Action addressed claims 6 and 17, the Applicants presume that the Examiner meant to address the rejection of claim 17, and not claim 13.

With respect to claim 6 and 17, the Examiner maintains the rejection of claims 6 and 17 under 35 USC §103 as being unpatentable over *Lee* in view of United States

Patent No. 6,406,924 B1, issued June 18, 2002, to *Grimbergen et al.* (hereinafter *Grimbergen*). The Applicants respectfully disagree.

Independent claims 1 and 11, as amended and from which claims 6 and 17 respectively depend, recite limitations not taught or suggested by any combination of *Grimbergen* and *Lee*. The patentability of amended claims 1 and 11 over *Lee* has been discussed above. *Grimbergen* teaches an endpoint detection method for use in the fabrication of electronic devices. Specifically, *Grimbergen* teaches selection of a radiation having a wavelength that is substantially absorbed in a first thickness of a layer disposed on a substrate and that is at least partially transmitted through a second thickness of the layer after processing. (*Grimbergen*, Abstract; Summary; col. 8, ll. 15-60. However, *Grimbergen* does not teach or suggest endpoint detection techniques using a pre-selected wavelength that is greater than or on the same order of magnitude as the initial thickness of the material layer. In fact, the examples provided by *Grimbergen* utilize wavelengths in nanometers (e.g., 365) that are less than the thickness of the layers in Angstroms (e.g., 5000 or 2000).

Accordingly, the teachings of *Grimbergen* cannot be used to modify *Lee* in a manner that yields an etch endpoint detection process that etches a high-k dielectric layer disposed on a substrate, wherein the pre-selected wavelength in nanometers is greater than or on same the order of magnitude as the initial thickness of the material layer in Angstroms, as recited in independent claims 1 and 11. Therefore, a *prima facie* case of obviousness has not been established because the combination of *Lee* and *Grimbergen* fails to yield each of the claimed elements of independent claims 1 and 11, and all claim depending therefrom.

Thus, claims 6 and 17 are patentable over *Lee* in view of *Grimbergen*. Accordingly, the Applicants respectfully request that the rejection be withdrawn and the claims allowed.

CONCLUSION

The Applicants submit that all claims now pending are in condition for allowance. Accordingly, both consideration of this application and swift passage to issue are earnestly solicited. If the Examiner believes that any unresolved issues still exist, it is requested that the Examiner telephone Alan Taboada at (732) 935-7100 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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